Welsh Government

M4 Corridor around Newport

December 2016 Environmental Statement Supplement Appendix SS10.1 Hazel Dormouse Survey 2016

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CVJV/AAR
3rd Floor
Longross Court,
47 Newport Road,
Cardiff
CF24 0AD

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Summary

S.1 RPS has undertaken a hazel dormouse survey of land along the route of the new section of motorway between Castleton and Magor proposed as part of the M4 Corridor around Newport (M4CaN) proposals.

S.2 Dormouse surveys previously undertaken by Arup in 2014 and RPS in 2015 on behalf of Welsh Government are reported separately in *Appendix 10.9* and *Appendix 10.26* of the March 2016 Environmental Statement (ES).

S.3 This report describes dormouse surveys undertaken from May to November 2016 using standard Dormouse Conservation Handbook (Bright *et al.,* 2006) methods.

S.4 During 2016 dormouse surveys were undertaken within:

- the highway soft estate isolated by the M4 and M48 motorways north of Undy;
- areas of suitable habitat to the east of Tata Steel;
- woodland within the grounds of Woodview House north of the existing M4 north of Undy; and
- Coed Mawr woodland.

S.5 Coed Mawr woodland is a 90ha woodland near Rogerstone owned by the Welsh Government and managed on its behalf by Natural Resources Wales (NRW). This woodland was surveyed extensively (500 dormouse survey tubes) to ascertain the presence or likely absence of hazel dormouse. This information has been gathered to assess the suitability of Coed Mawr to be utilised as a receptor site for hazel dormouse potentially captured and translocated from the footprint of the proposed new section of motorway.

S.6 Surveys within Tata Steel land were to complete survey effort following 2015 surveys (Appendix 10.26 of the March 2016 ES) in accordance with the Dormouse Conservation Handbook (Bright *et al* 2006). The presence of dormouse was confirmed during 2015 within scrub and hedgerow habitats within this area.

S.7 During the 2016 surveys dormouse nests were identified within the M4 / M48 Motorway Island (south); within Woodview woodland; and within young regenerating woodland at the south east of Coed Mawr woodland. No dormouse nests were found in the M4/M48 Motorway Island (north) and with Tata Steel land.

1 Introduction

1.1.1 RPS has undertaken a hazel dormouse *Muscardinus avellanarius* survey of land along the route of the new section of motorway between Castleton and Magor as part of the M4 Corridor around Newport (M4CaN) Scheme. For the purpose of this report hazel dormouse is hereafter known as 'dormouse'.

1.1.2 The survey was conducted in accordance with the methodology set out in the Dormouse Conservation Handbook (Bright *et al.,* 2006).

1.1.3 Dormouse surveys previously undertaken by Arup in 2014 and by RPS in 2015 are reported in *Appendix 10.9* and *Appendix 10.26* respectively of the March 2016 M4CaN Environmental Statement.

1.1.4 This document reports the findings of the dormouse survey which was undertaken from May to November 2016. It describes the methods used in the survey (Section 2) and the findings of the survey (Section 3). A discussion of the survey findings is provided in Section 4.

2 2016 Survey Methods

2.1 Introduction

2.1.1 The dormouse survey was carried out over the period May to November 2016, which falls within the optimum period for this type of survey.

2.1.2 The survey areas fell into two categories:

- Those along the alignment of the proposed new section of motorway where suitable habitat for dormouse was present that was not surveyed during 2015. and
- Areas that are under consideration as potential dormouse mitigation receptor sites.

2.1.3 Survey areas along the proposed alignment of the new section of motorway were Tata Steel and M4/M48 Motorway Islands (North and South) north of Undy.

2.1.4 Sites surveyed to ascertain suitability to receive translocated dormouse were Coed Mawr and woodland at Woodview House.

2.1.5 The location of all survey areas is shown in Figure 1.

2.2 Methodology

2.2.1 The survey method was based on the methodology described in the Dormouse Conservation Handbook (Bright *et al.,* 2006).

2.2.2 The survey involved installing nest tubes throughout each of the new survey areas and reinstalling nest tubes in locations for continued survey (i.e. east of Tata Steel land).

2.2.3 Table 2.1 below shows the dates and number of dormouse nest tubes installed and the dates when each site was surveyed.

Table 2.1 Dates of nest tube installation and dates when checked

Site	April	May	June	July	Aug	Sept	Oct	Nov
Coed Mawr woodland	500 tubes Installed		1st 2nd		1st	30th	1st 31st	1st
TATA Steel woodland -	50 tubes reinstalled		16th		30th		31st	
Woodview woodland	50 tubes installed		30th			29th	31st	
M4 / M48 motorway island (North)	-	-	50 tubes installed			7th		1st
M4/M48motorway island (South)	-	-	50 tubes installed			7th		1st

2.3 Survey Methods

2.3.1 The Nest Tube Surveys were carried out in accordance with the methodology set out in the Dormouse Conservation Handbook (Bright, *et al.*, 2006). The locations of dormouse nest tubes are shown in Figure 2a – d.

2.3.2 All areas surveyed were subject to a nest tube survey as described in the Dormouse Conservation Handbook (Bright *et al*, 2006) and English Nature Research Report 524 (Chanin and Woods, 2003)). Nest tubes were securely attached to appropriate branches of trees and shrubs at intervals of 10-20 metres. Nest tubes are constructed from stiff black plastic with a plywood tray inside.

2.3.3 Nest tubes were inspected in accordance with best practice guidelines, by an experienced ecologist. Any evidence including the presence of nests or gnawed nuts was recorded.

2.3.4 Dormouse nests are woven from strips of honeysuckle bark, or similar material, and frequently have whole leaves incorporated into their outer layers. These are often collected fresh and are either green or faded to grey. The nests are spherical and lack an obvious entrance hole. This distinguishes them from a wren's nest or harvest mouse nests, both of which have distinct entrance hole and are normally made of shredded grass.

2.4 Survey Effort

2.4.1 Survey effort for nest tubes can be quantified by applying the method stated in English Nature's Research Report 524 (English Nature, 2003). This methodology uses the table below to score each month according to the value of surveying.

Table 2.2 Index of probability of finding dormice present in nest boxes/tubes in any one month

Month	Index
May	4
June	2
July	2
August	5
September	7
October	2
November	2

2.4.2 Using 50 nest tubes as a standard and Table 2.2 as an index of the 'value' of different months for surveying, a score can be devised as an indicator of the thoroughness of a survey.

2.4.3 These values are based on standard of 50 tubes and therefore should be adjusted according to the number of tubes installed. For example, 100 tubes left out between September and November score 22 (7 + 2 + 2, multiplied by 2) because double the tubes are used. The Dormouse Conservation Handbook (Bright *et al* 2006) recommends a score of 20 to indicate a through survey.

2.4.4 The scores for the survey areas over the survey season are shown in Table 2.3.

Table 2.3 Survey Areas

Site	Number of tubes	Survey dates	Survey effort score
Coed Mawr woodland	500	May – October	180*
Tata Steel**	50	May – October	22
Woodview woodland	50	May – October	22
M4 / M48 motorway island (North)	50	July - October	16
M4/M48 motorway island (South)	25	July - October	8

* assumes whole woodland treated as a whole
** this is in additional to survey conducted during 2015

2.5 Limitations

2.5.1 During checks at the end of October to the south east of Tata Steel along North Row, nest tubes were found to have been damaged during hedgerow cutting during late summer 2016. Nest tubes in the rest of Tata Steel were intact so the loss of this small number is not considered to significantly affect the overall rating.

2.5.2 A few other nest tubes were damaged during the survey in some areas at Tata Steel by horses or other factors, but again this would not adversely affected the conclusions due to the number of tubes within that survey area and the presence of dormice already confirmed at that location.

2.5.3 Within the M4/M48 motorway island (South), 25 dormouse tubes were installed as access into the wooded area was very difficult due to dense woodland and the southern edge of the woodland abuts the live carriageway making access dangerous. The survey effort achieved did not meet the target score of 20, but presence of dormouse was confirmed in the M4 - M48 Island (South).

3 Results

3.1 Introduction

3.1.1 The results of the dormouse survey are described below for each of the survey areas. The locations of evidence and date of finding dormouse presence are shown on Figure 4a-d.

3.2 Description of Survey Sites

3.2.1 The following areas were surveyed between May and November 2016. The locations of these survey areas are shown on Figure 1.

Table 3.1: Description of 2016 Survey Sites

Survey site	Description
M4 / M48 Islands (North and South)	Islands of vegetation bounded on all side by the M4 and M48 carriageways. Habitat consists of young to semi-mature broadleaved plantation with areas of dense bramble scrub and occasional hazel.
Woodview woodland	Abundant ash with understory of occasional hazel, field maple and hawthorn. Semi mature silver birch are present throughout showing substantial damage through bark stripping by grey squirrel. Approximately 10 old apple trees are present within the north of the woodland. To the east of the woodland the landowners have removed dense bramble thickets and planted a mix of native and none native tree species including young common oak, turkey oak, hornbeam and pine.
Tata Steelworks	Interconnected hedgerow and scattered scrub bounded by minor roads to the north, east and south. Species present include bramble, hawthorn, willow, sycamore and blackthorn.
Coed Mawr	Coed Mawr is predominantly coniferous woodland with two large areas of young regenerating broadleaved woodland with silver birch, willow, bramble and gorse where conifers had been relatively recently clearly felled. Smaller areas of broadleaved woodland including hazel coppice, dense bramble and rowan (coppice) and beech woodland with hazel and willow woodland edge are present along with coniferous woodland with naturally regenerating broadleaved understorey, including hazel and hornbeam. Figure 3 shows broad habitat types at Coed Mawr.

3.3 Survey Findings

Coed Mawr

3.3.1 Dormouse presence was confirmed in the south east of this large woodland area.

3.3.2 A dormouse nest with tightly woven grass at the centre and old bracken leaves (Plate 3.3) was found during nest tube checks at the beginning of November.

The nest was found in an area of young regenerating woodland in the south east of the woodland as shown in Figure 4a.

3.3.3 A birds nest (likely blue tit) found during August 2016 checks was the only other finding during the 2016 surveys.

Tata Steel

3.3.4 No dormice or any other mammal nests were found in any nest tubes during the 2016 survey.

Woodview Woodland

3.3.5 A single old dormouse nest was found during the September survey. The nest, characteristically for dormouse, contained green leaves and woven material within the centre (Plate 3.2). The nest was found in the northeast corner of the woodland as shown in Figure 4c.

3.3.6 A wood mouse nest and a wood mouse food cache was also found during the September survey.

M4/M48 Island (North)

3.3.7 No dormouse or any other mammal nests were found in any nest tubes during the 2016 survey.

M4/M48 Island (South)

3.3.8 Dormouse presence was confirmed within this area of woodland. A single dormouse nest was found in the M4 island at the end of October. The nest contained fresh green leaves and had woven material in the centre of the nest (plate 3.1). The nest was found along the north edge of the woodland as shown in Figure 4d.

3.3.9 Five wood mouse nests were also in nest tubes found within this woodland.

4 Discussion

4.1 Introduction

4.1.1 The 2016 dormouse surveys were conducted to augment surveys conducted during 2014 and 2015 and to assess sites for their potential to be used as receptor sites. Surveys were conducted in land with the eastern parts of the Tata Steel landholding in order to complete the survey effort in this area.

4.2 Survey Findings

4.2.1 During the 2016 surveys dormouse presence was found at three locations, these were:

- Within the M4/M48 Motorway Island (South).
- Within semi-natural woodland to the east of Woodview woodland.
- Within an area of young regenerating woodland in the south east of the Coed Mawr woodland complex.

4.2.2 The M4/M48 Motorway Island (South) is a 0.6 ha area of woodland bordered to the north by the 36m wide six lane motorway and to the south by a 13m wide two lane slip road. It is reasonable to assume that dormouse have colonised this island from woodland and scrub habitats along the motorway verges.

4.2.3 Woodview woodland is surrounded by a network of well managed, dense, species rich hedgerows that link areas of semi-natural woodland and records of dormouse were identified to the south during 2015 surveys.

4.2.4 Dormouse presence was confirmed within young regenerating woodland in the south east of Coed Mawr. NRW have advised that this area was clear felled from coniferous woodland during 2011 and was replanted with oak. The rapid colonisation of these areas with dense bramble thicket and associated pioneer vegetation has resulted in the establishment of suitable habitat for dormouse.

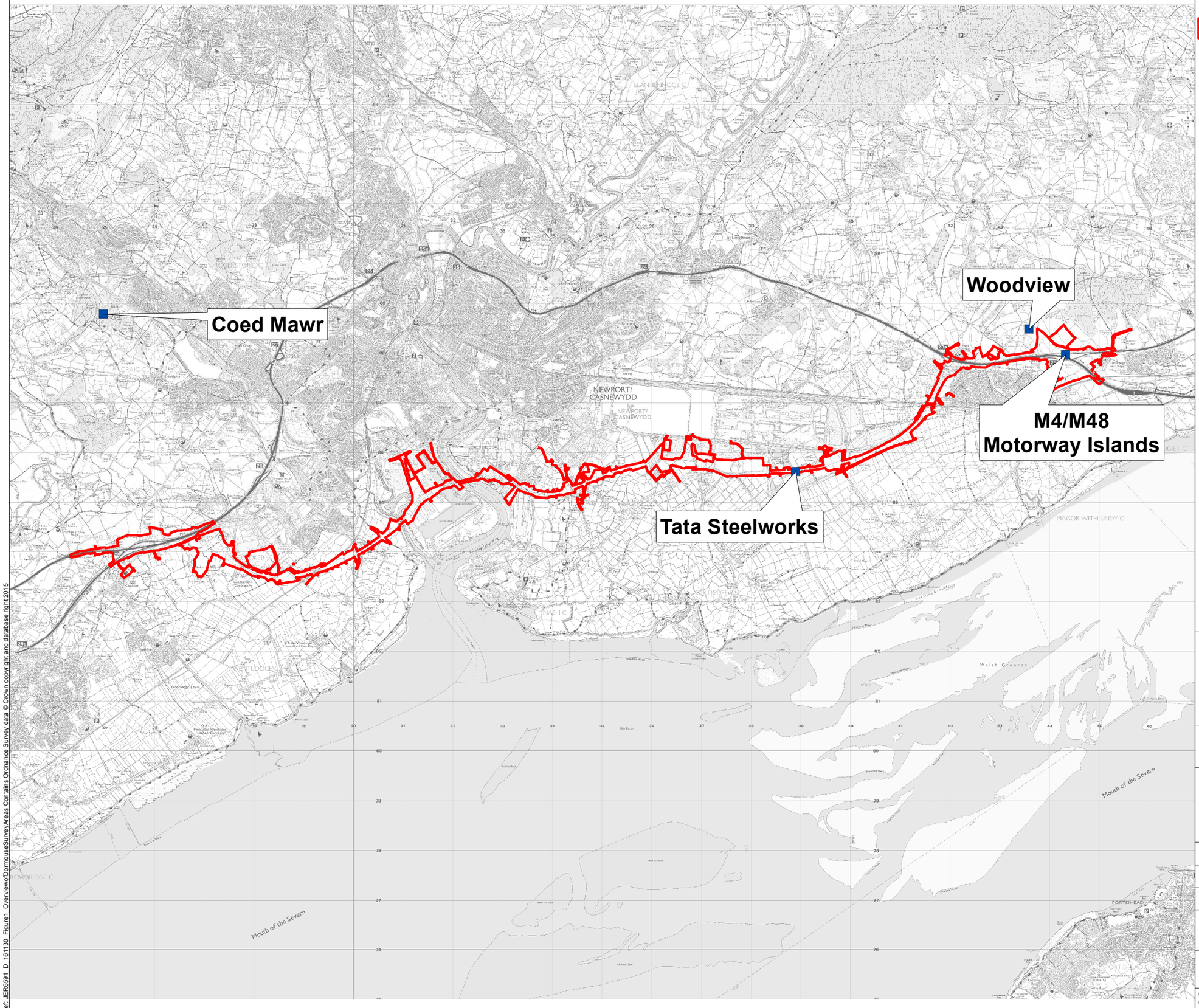
References

Bright, P.W., Mitchell, P. & Morris, P.A., (1994). *Dormouse distribution: survey techniques, insular ecology and selection of sites for conservation.* Journal of Applied Ecology. 31: 329–339

Bright, P.W., Morris, P.A and Mitchell-Jones, T., (2006). *The Dormouse Conservation Handbook- Second edition*. English Nature, Peterborough.

Chanin P. and Woods M. (2003). English Nature Research Report (No 524) - Surveying dormice using nest tubes. Results and experiences from the South West Dormouse Project

Figures



Legend

- Permanent and Temporary Landtake
- Dormouse Survey Locations

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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 1: Overview of 2016 Dormouse Survey Areas

Figure: 1	Revision: -
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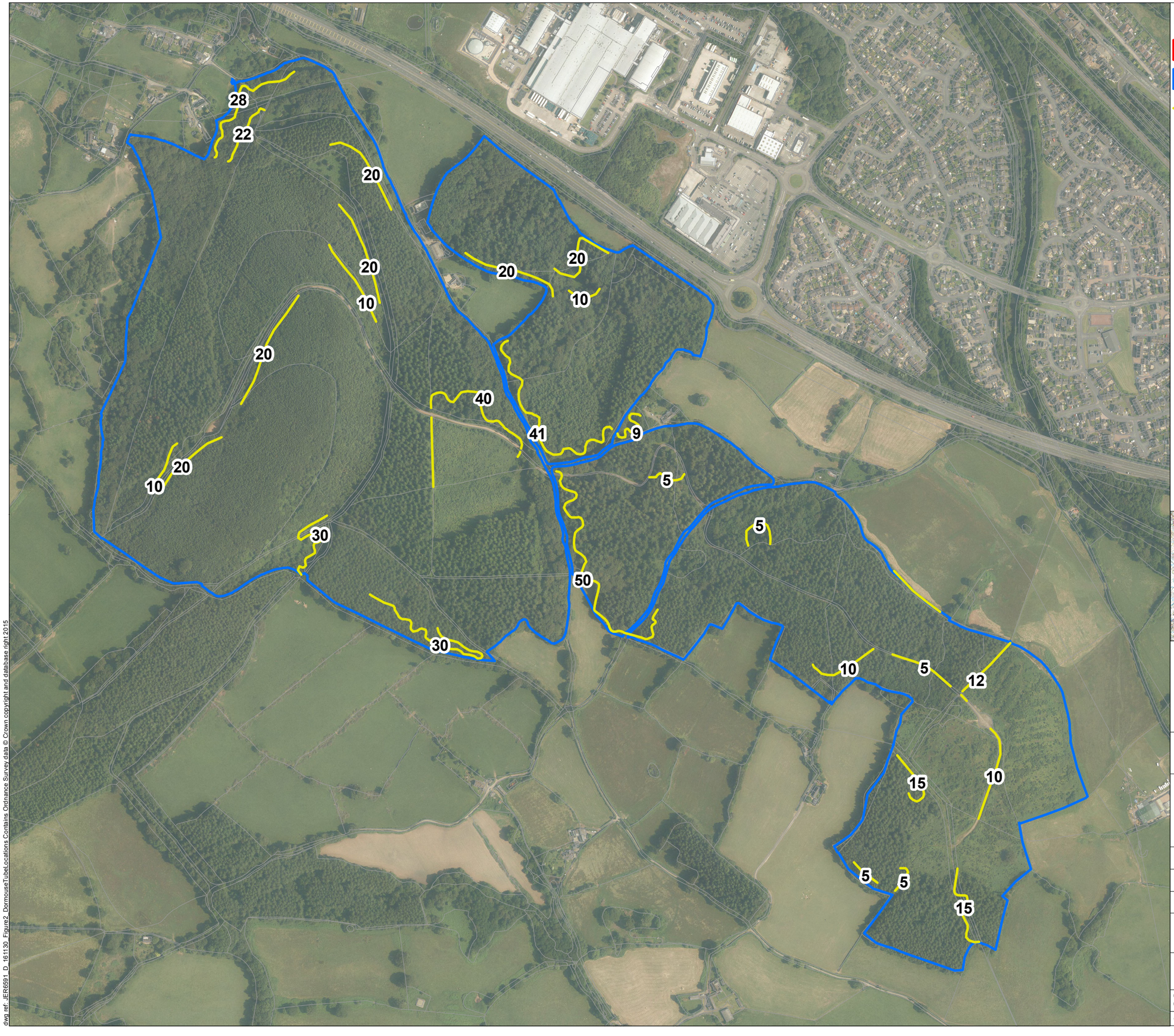

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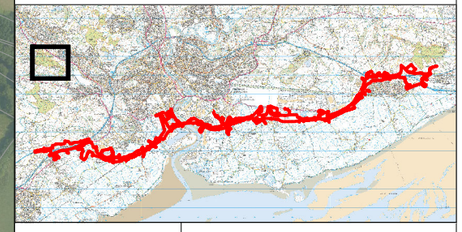
- Survey Boundary
- Dormouse Tubes Installation Transect
- 20 Number of Traps



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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 2: Coed Mawr Dormouse Nest Tube Locations

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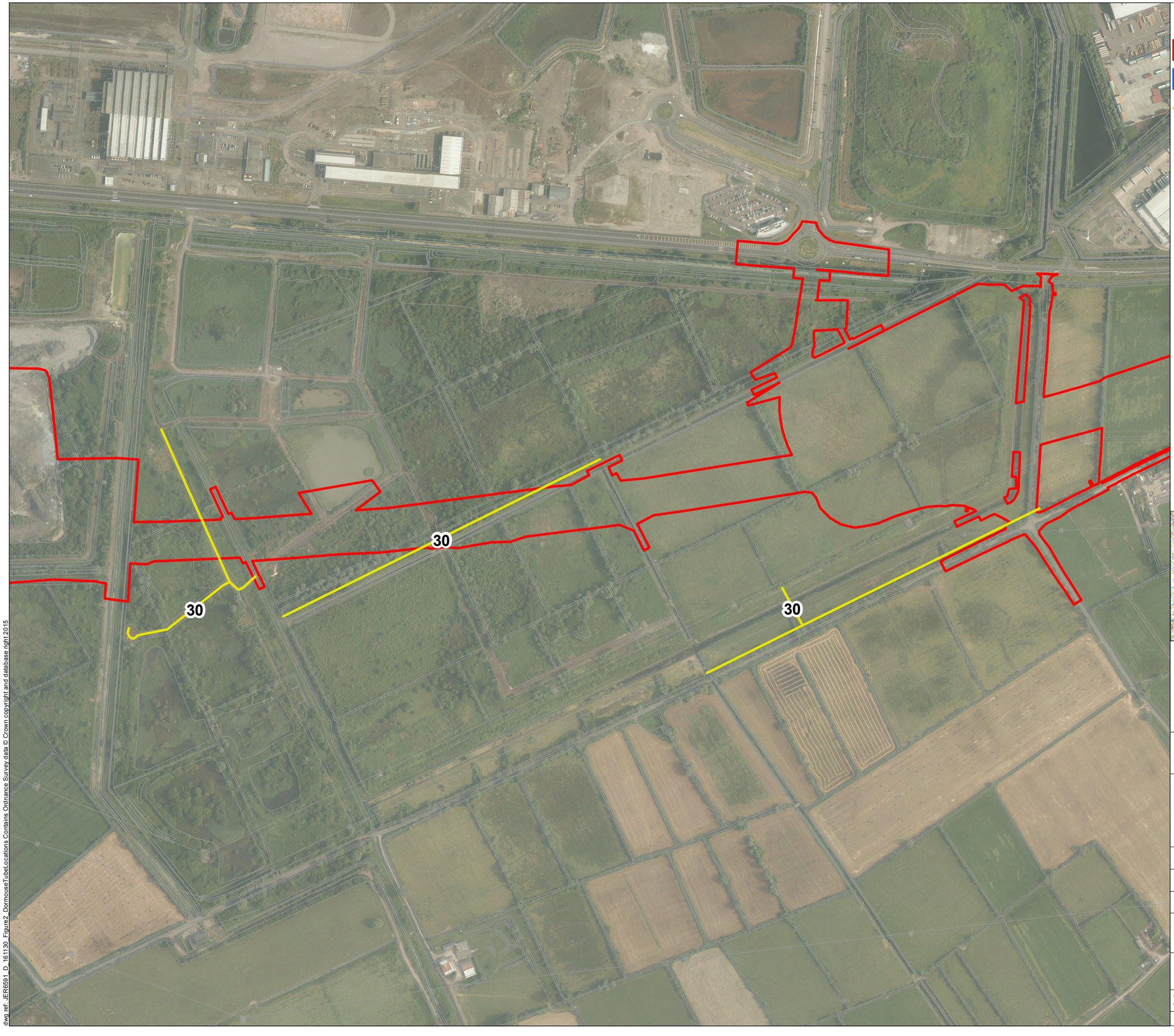

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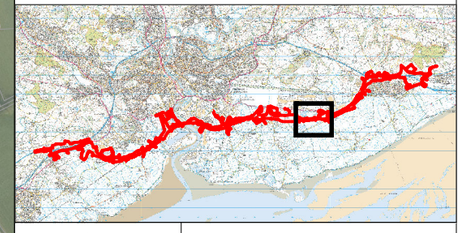

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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 2: TATA Dormouse Nest Tube Locations

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Scale: A3 @ 1:6,000

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Legend

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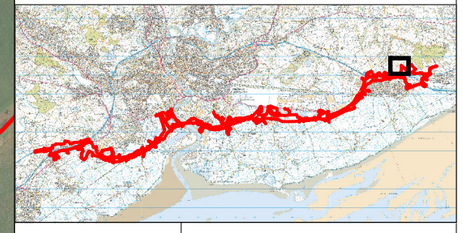
- Survey Boundary
- Dormouse Tubes Installation Transect
- 20 Number of Traps



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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 2: Woodview Dormouse Nest Tube Locations

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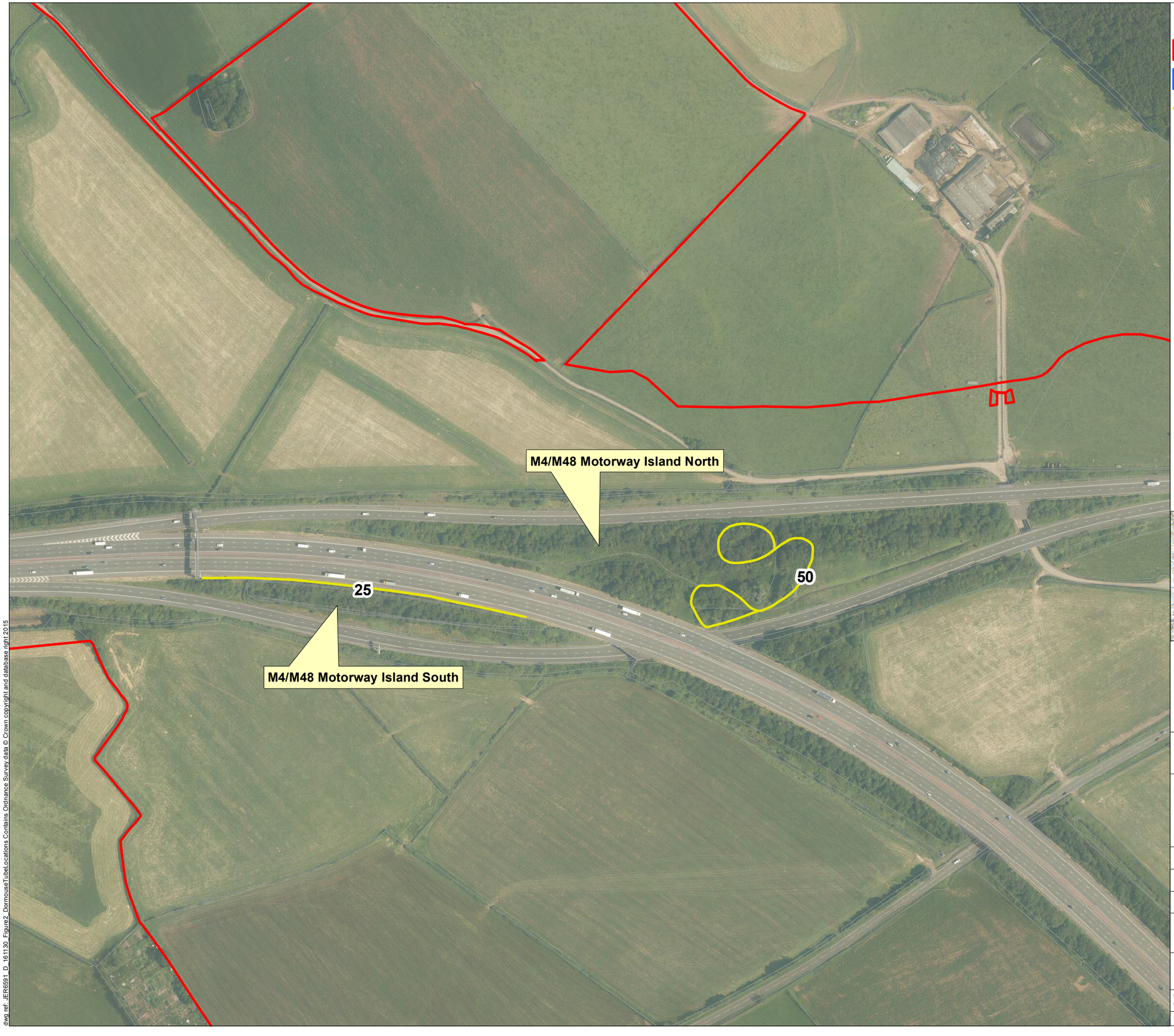

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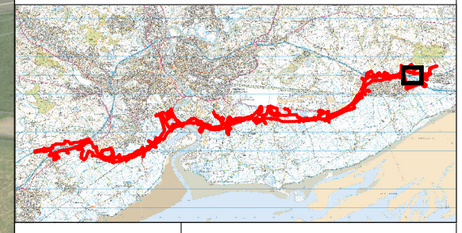
- 20 Number of Traps



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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 2: M4/M8 Motorway Island Dormouse Nest Tube Locations

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Date: December 2016	Status: AT ISSUE
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Legend

- Mature Oak Trees
- Survey Boundary

High Value Habitat

- Broadleaved woodland including hazel coppice, dense bramble and rowan (coppice)

Medium Value Habitat

- Beech woodland with hazel and willow woodland edge
- Young naturally regenerating broadleaved woodland with silver birch, willow, bramble and gorse
- Coniferous woodland with naturally regenerating broadleaved understorey shrub layer, including hazel and hornbeam
- Mixed woodland

Low Value Habitat

- Coniferous woodland

High Value Habitat	Area (Ha)
Broadleaved woodland	8.86
Medium Value Habitat	**Area (Ha)**
Beech woodland	8.05
Young regenerating broadleaved woodland	11.52
Coniferous woodland with developing broadleaved understory	7.21
Mixed woodland	4.55
Low Value Habitat	**Area (Ha)**
Coniferous woodland	50.28

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Appendix SS10.1 Hazel Dormouse Survey 2016

Coed Mawr – Habitat Map

Figure: 3	Revision: a
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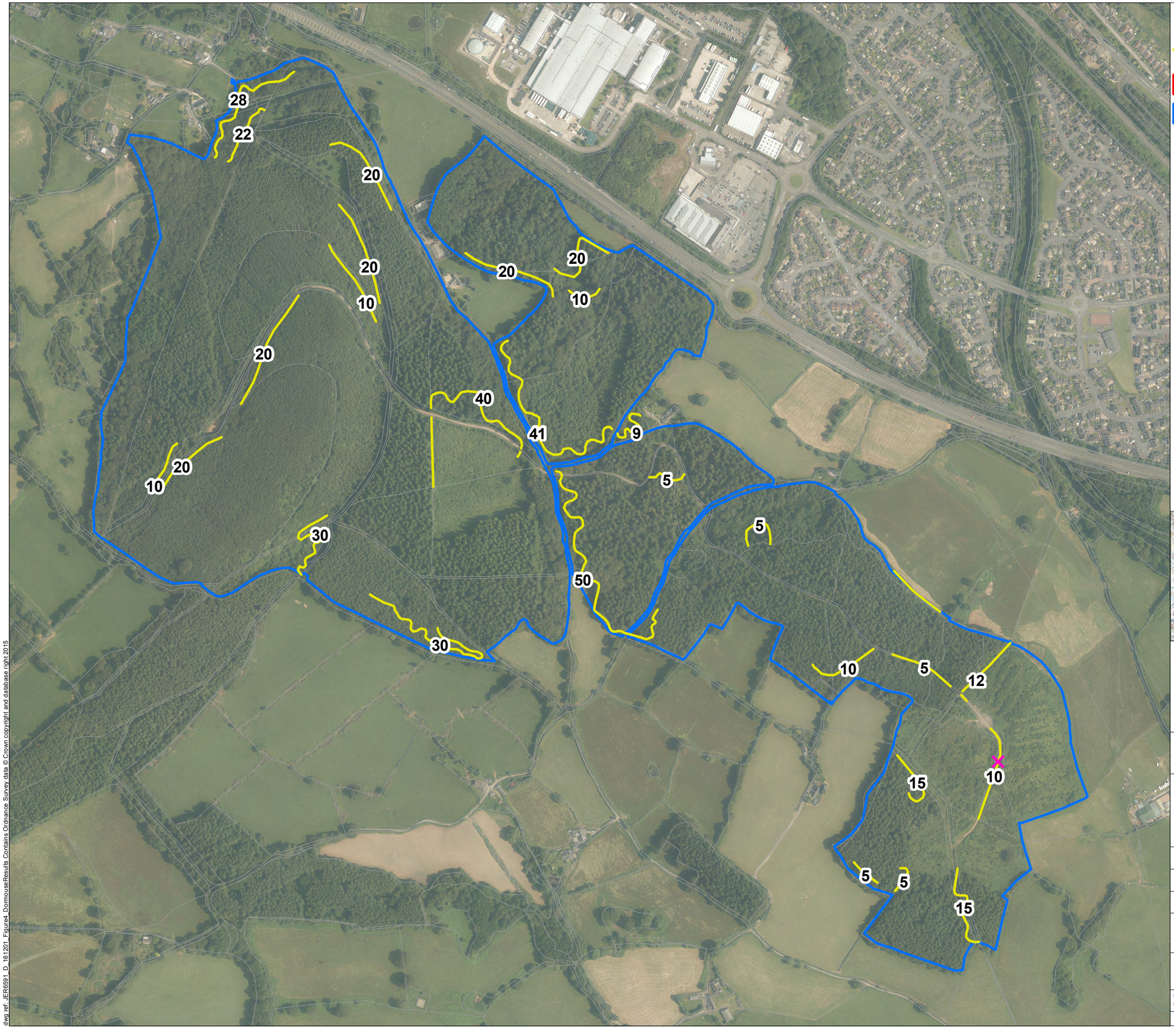

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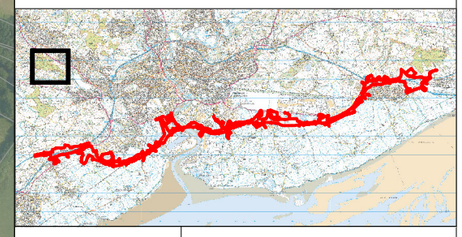
- Dormouse Tubes Installation Transect
- Permanent and Temporary Landtake
- Survey Boundary
- 20 Number of Traps
- × Probable Dormouse Nest Found November 2016



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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 4: Coed Mawr Locations of Dormouse Nests Within Nest Tubes (2016)

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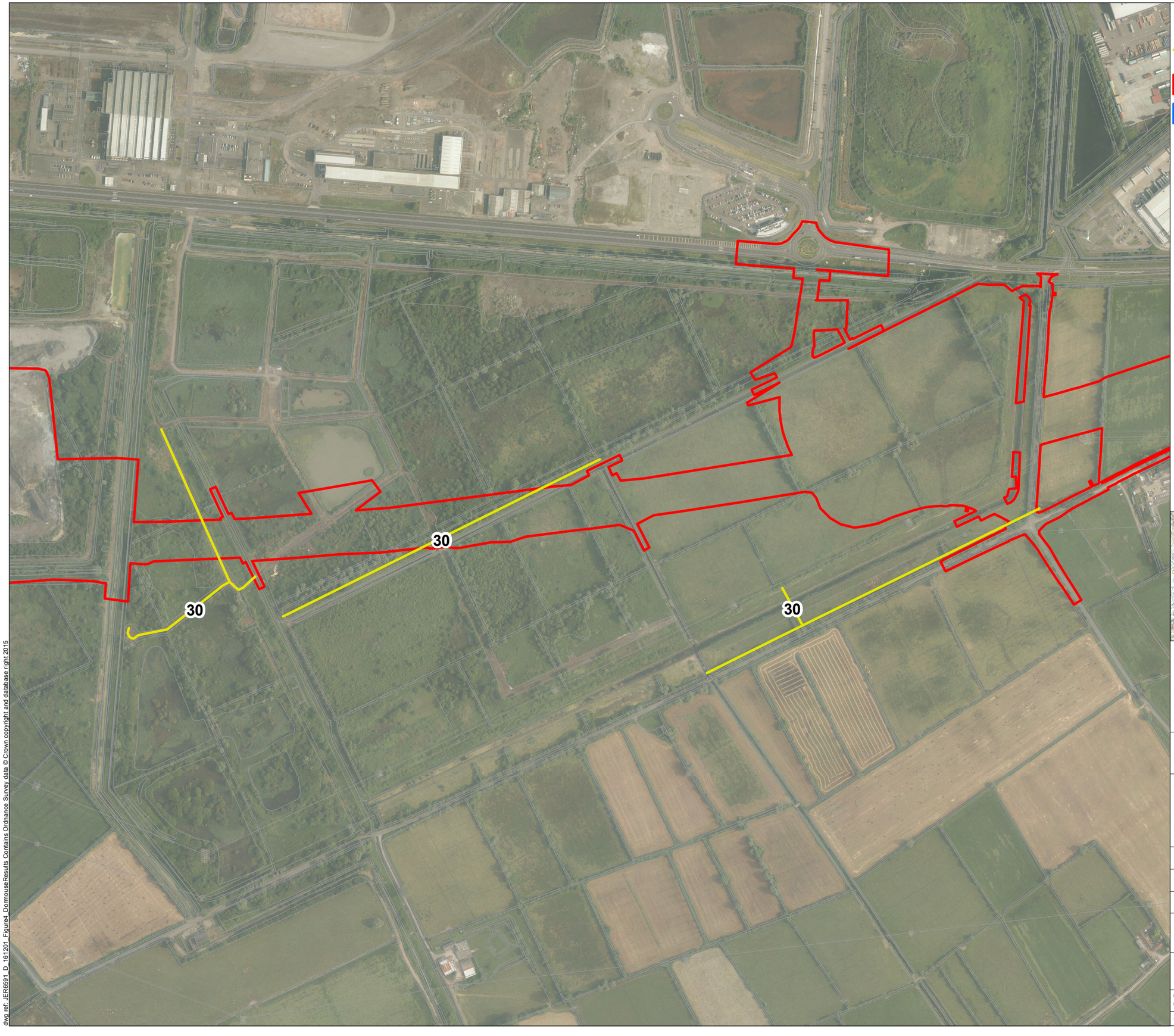

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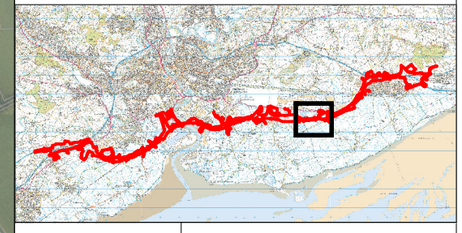
- Dormouse Tubes Installation Transect
- Permanent and Temporary Landtake
- Survey Boundary
- 20 Number of Traps
- Probable Dormouse Nest Found November 2016



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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 4: TATA Locations of Dormouse Nests Within Nest Tubes (2016)

Figure: 4b	Revision: -
Date: December 2016	Status: AT ISSUE
Drawn: JGB	Checked: EW

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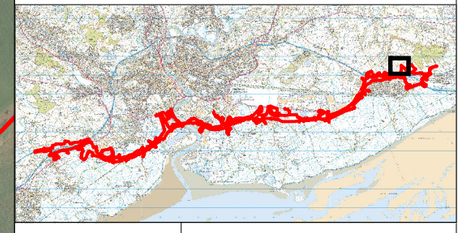
Legend

- Dormouse Tubes Installation Transect
- Permanent and Temporary Landtake
- Survey Boundary
- 20 Number of Traps
- Probable Dormouse Nest Found November 2016



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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 4: Woodview Locations of Dormouse Nests Within Nest Tubes (2016)

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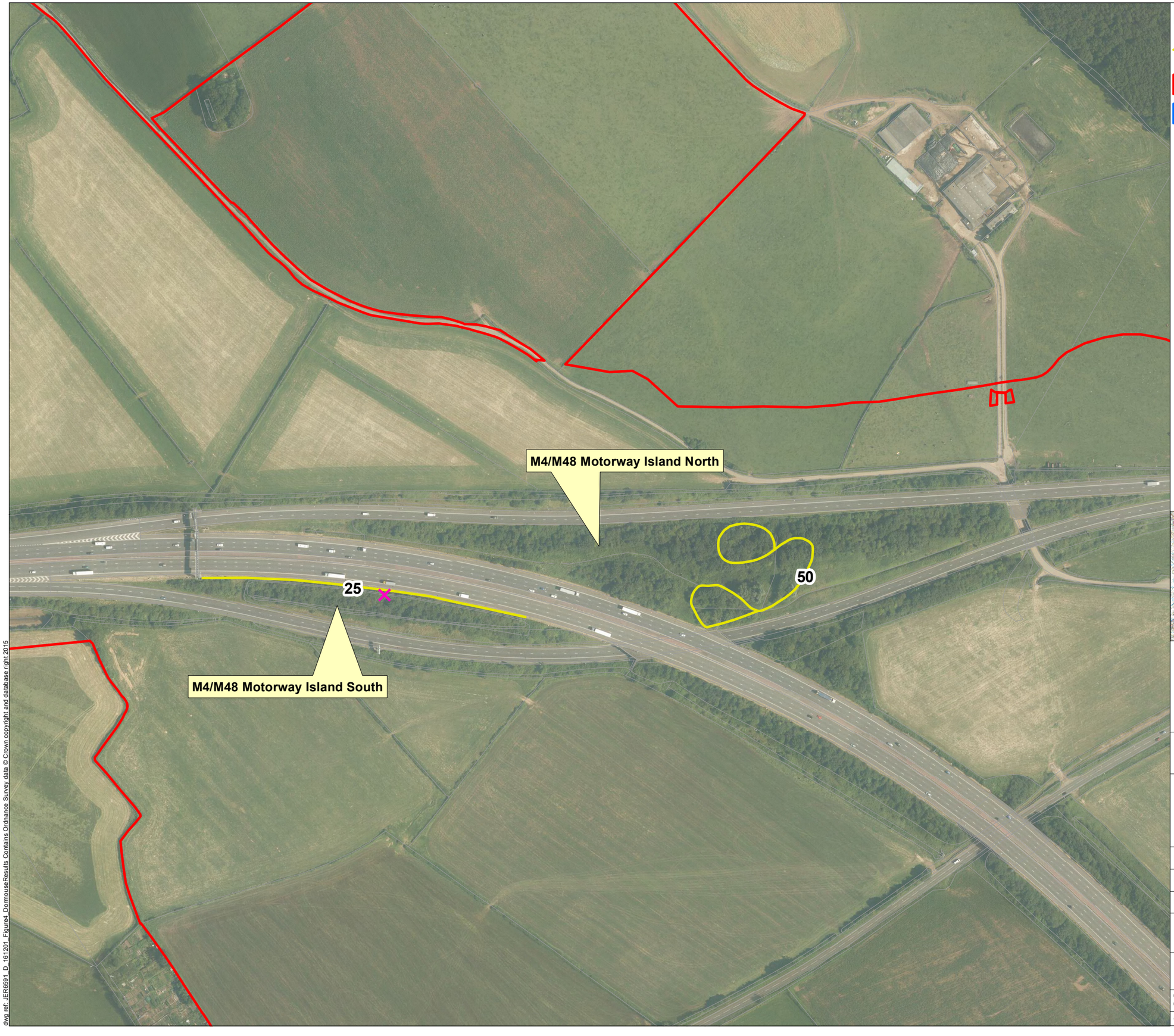

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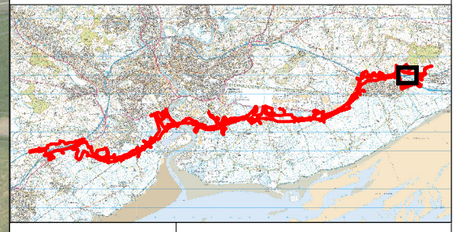
- Dormouse Tubes Installation Transect
- Permanent and Temporary Landtake
- Survey Boundary
- 20 Number of Traps
- Probable Dormouse Nest Found November 2016



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Appendix SS10.1 Hazel Dormouse Survey 2016

Figure 4: M4/M8 Motorway Island Locations of Dormouse Nests Within Nest Tubes (2016)

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Annex A – photographs of dormouse nests found during 2016

Annex A

Plate 3.1 showing dormouse nest found at end of October within M4 Motorway Island

Plate 3.2 showing old dormouse nest found during September in Woodview woodland

Plate 3.3 showing old dormouse nest found in Coed Mawr woodland during nest tube checks at the start of November